

# Indiana's State Wildlife Action Plan

## Planning Region 3: Corn Belt

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SURVEY 1 REPORT

**SWAP**

*Conservation doesn't just happen. It requires resources and collaboration.*

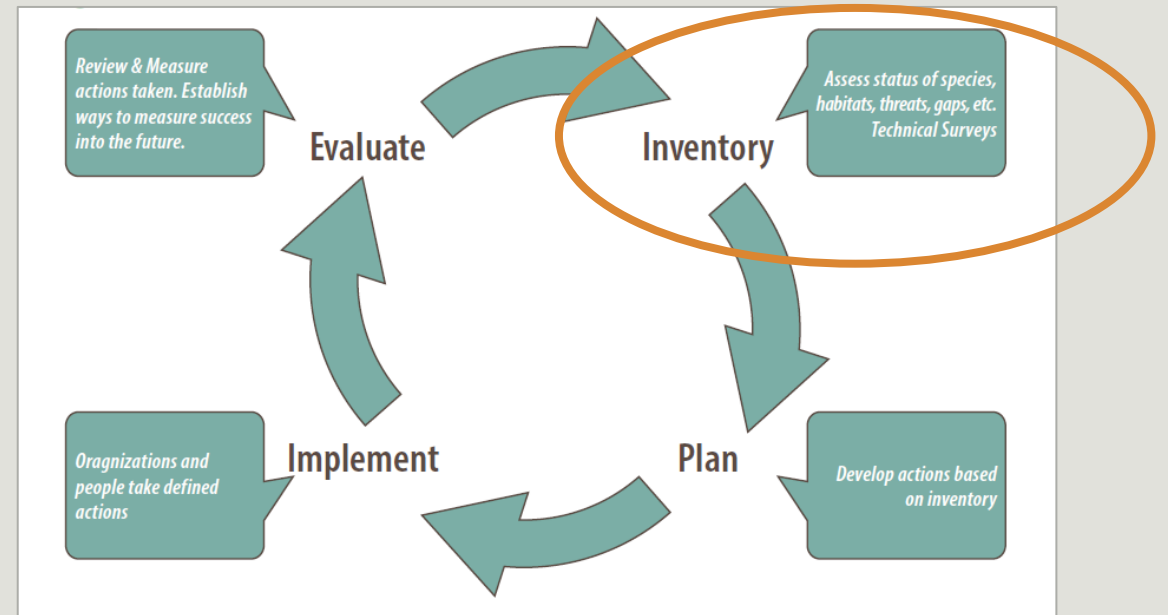
# Survey 1: Purpose

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Focused on species of greatest conservation need (SGCN)

Update status & assess trends

State-wide perspective



# Survey 1 Questions

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1. Update basic information about SGCN
  - Trends in abundance (past and future)
2. Assess habitat conditions for SGCN
  - Current conditions
  - Trends in quantity and quality (past and future)

Target audience:  
technical experts from  
state agencies,  
universities, and other  
organizations working  
directly with SGCN

# Survey 1 Questions

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3. Determine threats to SGCN using common language
4. Discuss conservation actions directly relevant to species
  - Barriers to implementation
  - Effectiveness of actions taken since 2005
5. Choose representative species for landscape-level habitat modelling
  - Regional perspective

Target audience:  
technical experts from  
state agencies,  
universities, and other  
organizations working  
directly with SGCN

# Survey 1 Responses

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Total responses: 486 (1-15 per species)

Additional data updates:

- Changes in conservation status
- Regional distribution
- Habitat associations
- Changes in land cover
- Insect distribution & habitat

**Survey About Species of Greatest Conservation Need and  
Selection of Indicator Species in Indiana**

— In Support of the 2015 Indiana State Wildlife Action Plan —



# Changes to SGCN List

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## Removed

- Bobcat
- River otter



Reintroduced river otters. Credit: IDNR

## Removal suggested

- Bald eagle
- Osprey
- Peregrine falcon
- Sandhill crane
- Species occurring in Indiana on periphery of their range

# Changes to SGCN List

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## Added

- Migratory shorebirds
  - Ruddy turnstone, buff-breasted sandpiper, short-billed dowitcher, Wilson's phalarope, American golden-plover, greater yellowlegs, solitary sandpiper
- Eastern small-footed myotis
- Northern cricket frog
- Mole salamander
- Eastern box turtle

## Addition suggested

- All cave bats
- Ruffed grouse
- American woodcock
- Northern bobwhite



Cave bats affected by white-nose syndrome.  
Credit: Bat Conservation Trust

# SGCN – Region 3

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## Mammals (12)

- Bats (7)
  - Silver-haired Bat
  - Eastern Red Bat
  - Hoary Bat
  - Little Brown Myotis
  - Northern Long-eared Myotis
  - Indiana Myotis
  - Tri-colored Bat (Eastern Pipistrelle)
- Mustelids (2)
  - Least Weasel
  - American Badger
- Moles (1)
  - Star-nosed Mole
- Rodents (2)
  - Franklin's Ground Squirrel
  - Plains Pocket Gopher



Eastern red bat. Credit: John Farabaugh



# SGCN – Region 3

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## Breeding Birds (34)

- Cranes (1)
  - Sandhill Crane
- Shorebirds (1)
  - Upland Sandpiper
- Herons, Egrets, & Bitterns (5)
  - Great Egret
  - American Bittern
  - Least Bittern
  - Yellow-crowned Night-Heron
  - Black-crowned Night-Heron
- Rails (3)
  - Common Moorhen
  - King Rail
  - Virginia Rail
- Terns (2)
  - Black Tern
  - Least Tern
- Nightjars (2)
  - Eastern Whip-poor-will
  - Common Nighthawk
- Raptors (10)
  - Sharp-shinned Hawk
  - Short-eared Owl
  - Red-shouldered Hawk
  - Broad-winged Hawk
  - Northern Harrier
  - Peregrine Falcon
  - Bald Eagle
  - Osprey
  - Barn Owl
- Songbirds (10)
  - Henslow's Sparrow
  - Marsh Wren
  - Sedge Wren
  - Worm-eating Warbler
  - Loggerhead Shrike
  - Black-and-white Warbler
  - Cerulean Warbler
  - Hooded Warbler
  - Golden-winged Warbler
  - Yellow-headed Blackbird



Henslow's sparrow. Credit: Matt Stratmoen

# SGCN – Region 3

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## Migratory Birds (9)

- Cranes (1)
  - Whooping Crane
- Waterfowl (1)
  - Trumpeter Swan
- Rails (1)
  - Black Rail
- Shorebirds (6)
  - Ruddy Turnstone
  - Buff-breasted Sandpiper
  - Short-billed Dowitcher
  - Wilson's Phalarope
  - American Golden-Plover
  - Greater Yellowlegs
  - Solitary Sandpiper



Foraging shorebirds. Credit: NRCS

# SGCN – Region 3

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## Amphibians & Reptiles (13)

- Aquatic Salamanders (1)
  - Mudpuppy
- Terrestrial Salamanders (1)
  - Four-toed Salamander
- Frogs (4)
  - Northern Cricket Frog
  - Crawfish Frog
  - Plains Leopard Frog
  - Northern Leopard Frog
- Snakes (3)
  - Kirtland's Snake
  - Massasauga
  - Butler's Gartersnake
- Turtles (4)
  - Spotted Turtle
  - Blanding's Turtle
  - Eastern Box Turtle
  - Ornate Box Turtle



Northern leopard frog. Credit: Derek Gavey

# SGCN – Region 3

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## Fish & Mollusks (29)

- Carps & Minnows (1)
  - Redside Dace
- Lampreys (1)
  - Northern Brook Lamprey
- Perches (4)
  - Spotted Darter
  - Tippecanoe Darter
  - Channel Darter
  - Gilt Darter
- Suckers (1)
  - Greater Redhorse
- Trouts & Salmons (1)
  - Cisco
- Snails (2)
  - Pointed Campeloma
  - Swamp Lymnaea
- River Mussels (19)
  - Fanshell
  - Northern Riffleshell
  - Tubercled Blossom
  - Snuffbox
  - Longsolid
  - Wavyrayed Lampmussel
  - Round Hickorynut
  - White Wartyback
  - Sheepnose
  - Clubshell
  - Ohio Pigtoe
  - Pyramid Pigtoe
  - Kidneyshell
  - Rabbitsfoot
  - Salamander Mussel
  - Purple Lilliput
  - Ellipse
  - Rayed Bean
  - Little Spectaclecase



River mussel diversity. Photo courtesy of USFWS.

# Survey Results Summary

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## 1. Trends in Abundance

- Past
- Future

## 2. Current Habitat conditions

- Total amount
- Overall quality

## 3. Past Habitat Trends

- Total amount
- Overall quality

## 4. Future Habitat Trends

- Total amount
- Overall quality

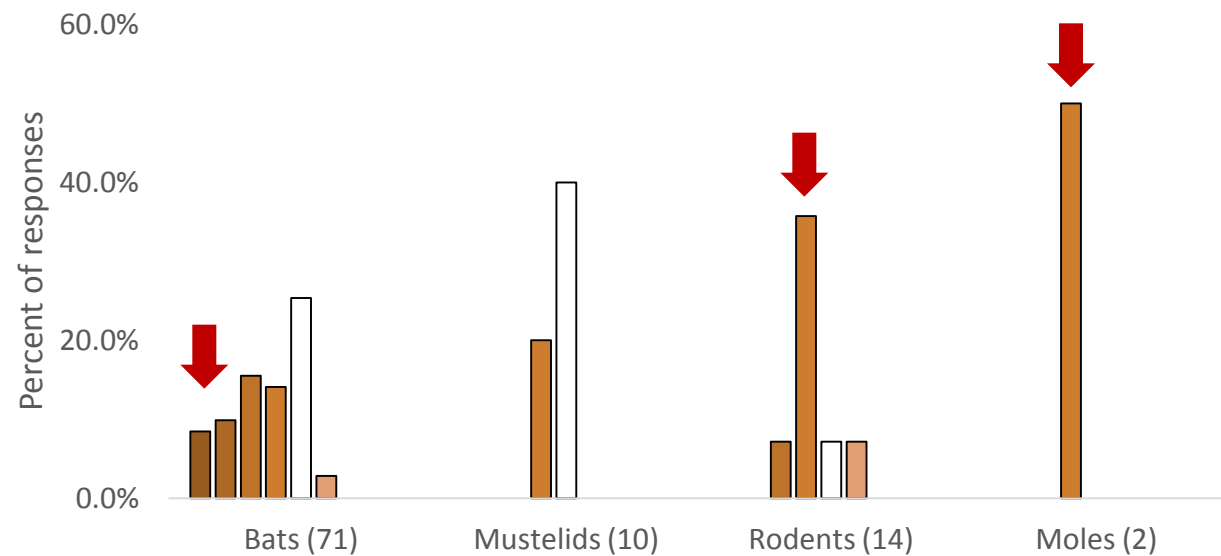
# Survey Results: Past Trends in Abundance

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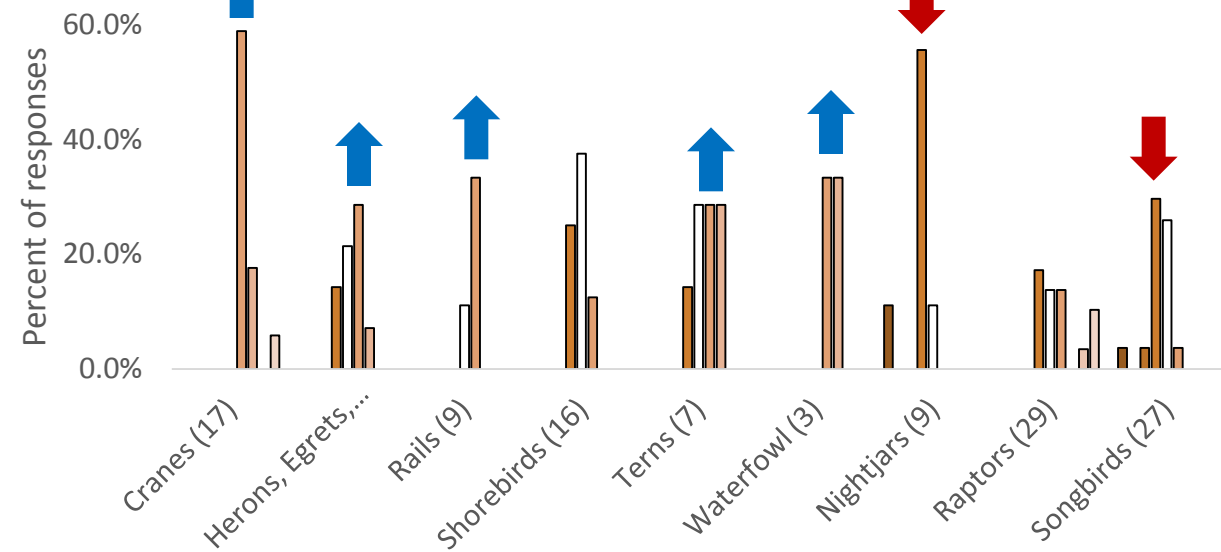
*Goal:* Determine which species have declined or increased most since the 2005 SWAP was implemented, and get an overall sense of how populations of SGCN have done since then.

*Question:* Estimate the change in abundance of [species] in Indiana **since 2005.**

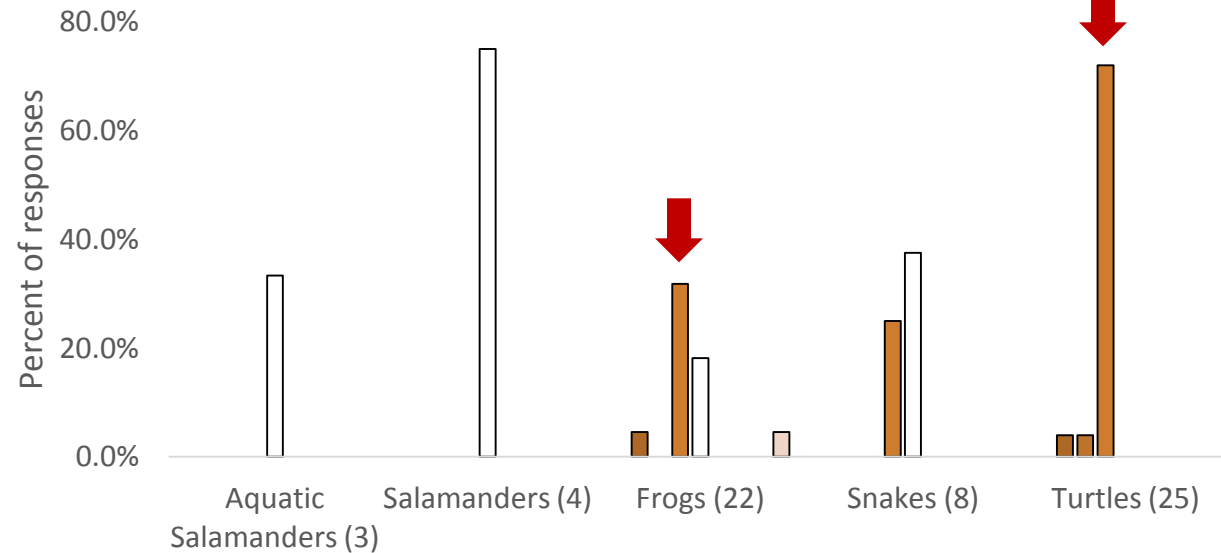
Trends in Abundance of Mammals since 2005



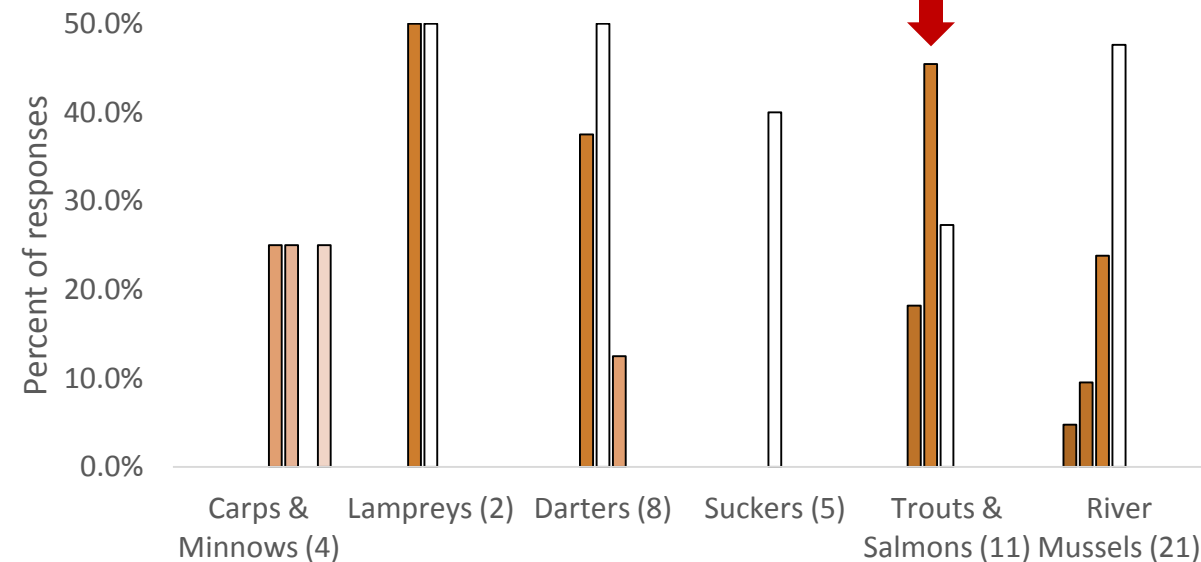
Trends in Abundance of Birds since 2005



Trends in Abundance of Amphibians &amp; Reptiles since 2005



Trends in Abundance of Aquatic Species since 2005



Declined by &gt;75%

Declined by 50-75%

Declined by 25-50%

Declined by 5-25%

Remained relatively constant

Increased by 5-25%

Increased by 25-50%

Increased by 50-75%

Increased by &gt;75%

# Survey Results: Future Trends in Abundance

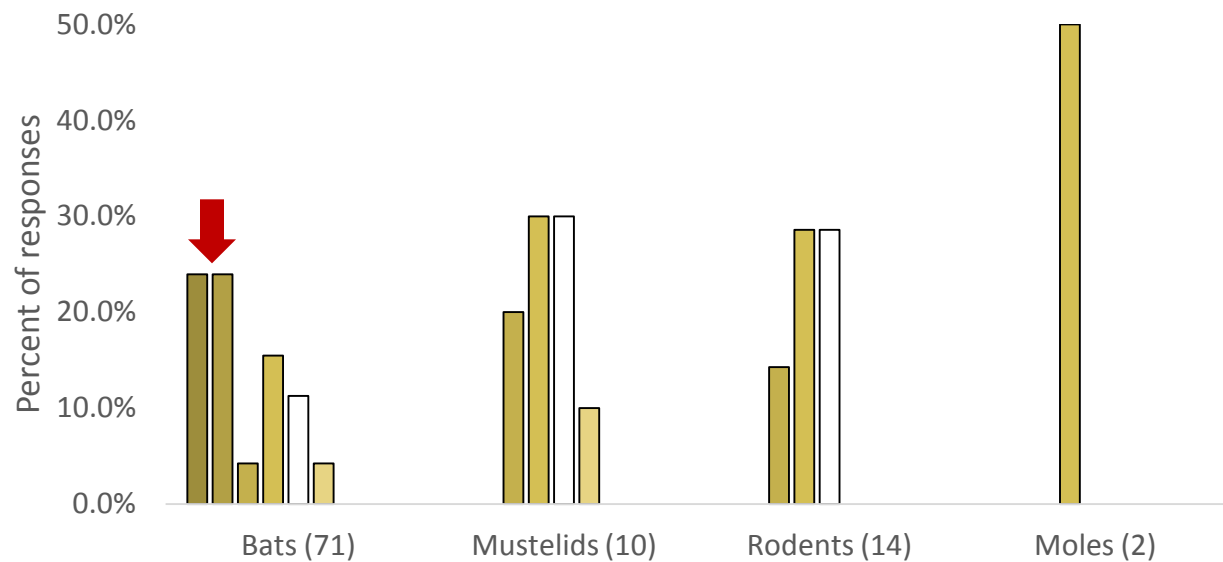
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*Goal:* Determine which species are most likely to decline or increase while the 2015 SWAP is in place, and get an overall sense of how SGCN can be expected to do over the next decade if actions are not taken.

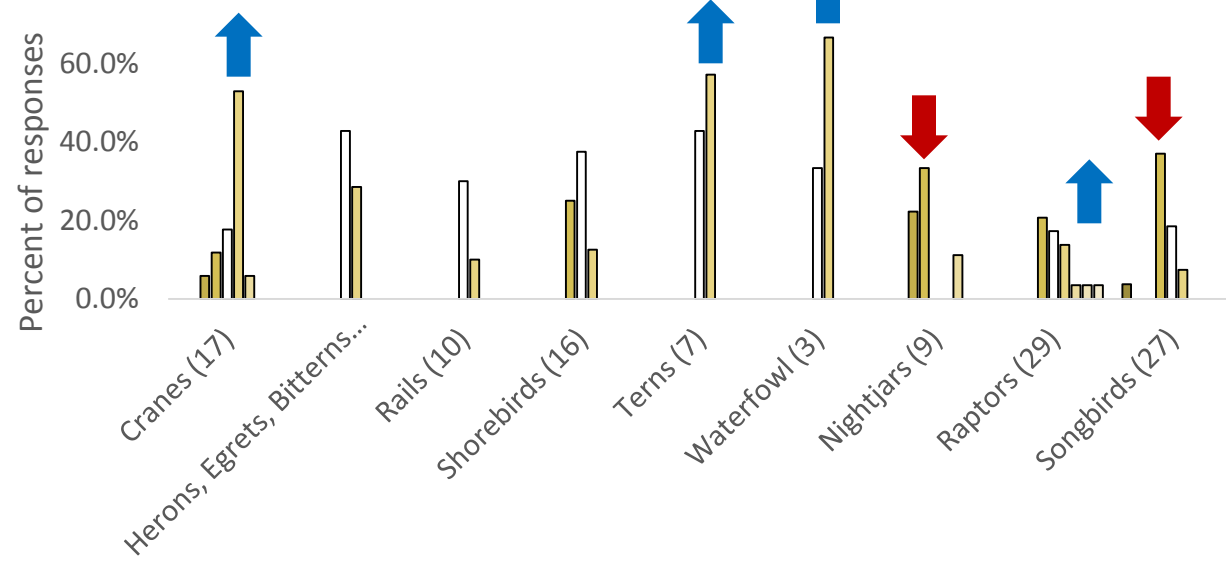
*Question:* How would you predict the abundance of [species] in Indiana to change **over the next 10 years**, if current conditions and practices prevail?



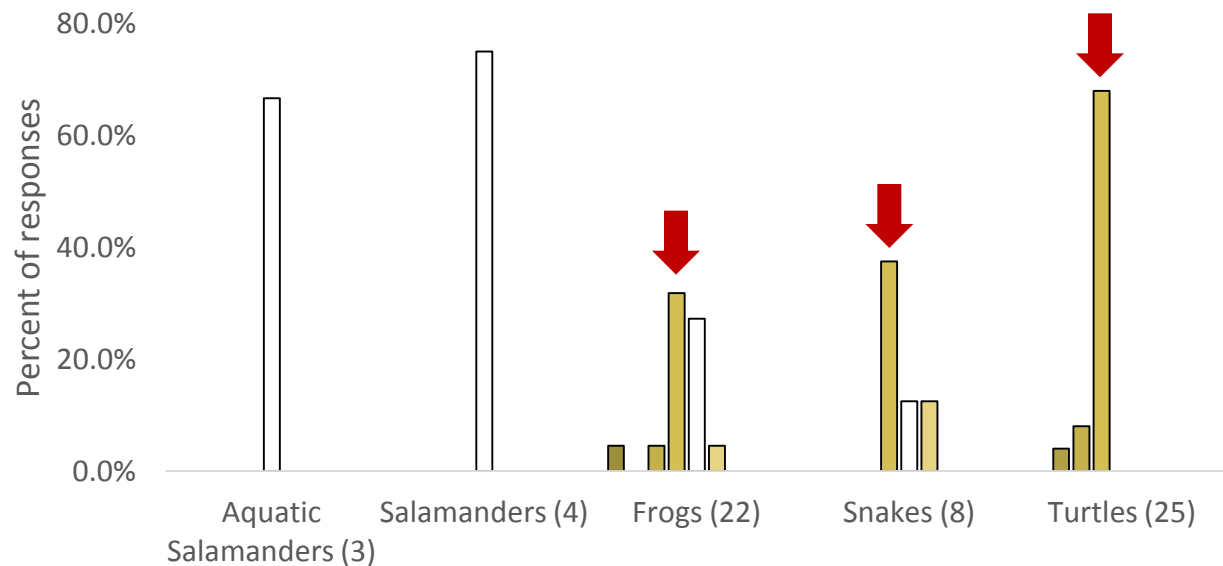
Trends in Abundance of Mammals by 2025



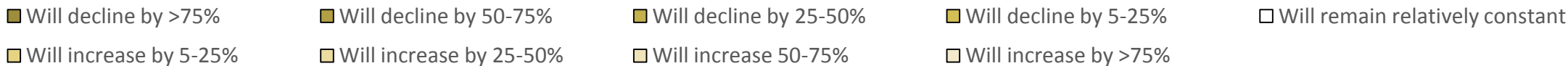
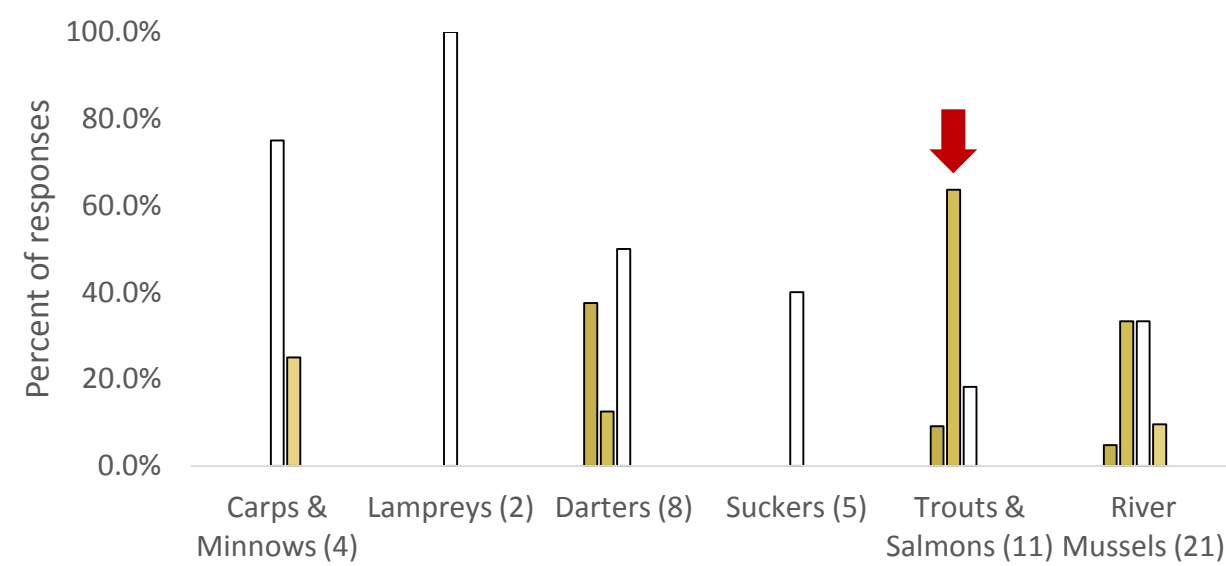
Trends in Abundance of Birds by 2025



Trends in Abundance of Amphibians &amp; Reptiles by 2025



Trends in Abundance of Aquatic Species by 2025



# Trends in Abundance

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Species in serious/dramatic decline **since 2005**:

- Eastern whip-poor-will
- Loggerhead shrike
- Little brown myotis
- Northern long-eared myotis
- Tri-colored Bat (Eastern Pipistrelle)
- Round hickorynut mussel

Species expected to seriously decline **by 2025**, if current conditions & practices prevail:

- Loggerhead shrike
- Little brown myotis
- Northern long-eared myotis
- Indiana myotis
- Tri-colored Bat (Eastern Pipistrelle)



Whip-poor-will, loggerhead shrike, Indiana bat. Credits: Paul Cools , John Maxwell, Justin Boyles

# Trends in Abundance

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Species that have greatly/dramatically increased **since 2005:**

- Whooping crane
- Bald eagle
- Osprey
- Trumpeter swan

Species expected to greatly/dramatically increase **by 2025**, if current conditions & practices prevail:

- Bald eagle
- Osprey



Whooping cranes, bald eagle, osprey, trumpeter swan. Credits: IDNR/USFS

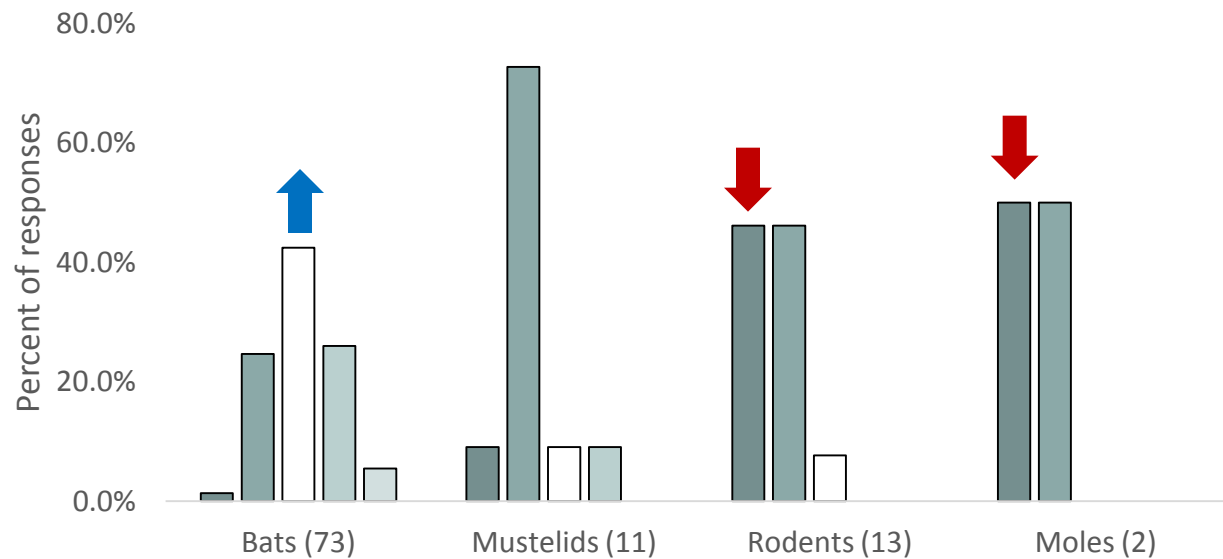
# Survey Results: Current Habitat Conditions

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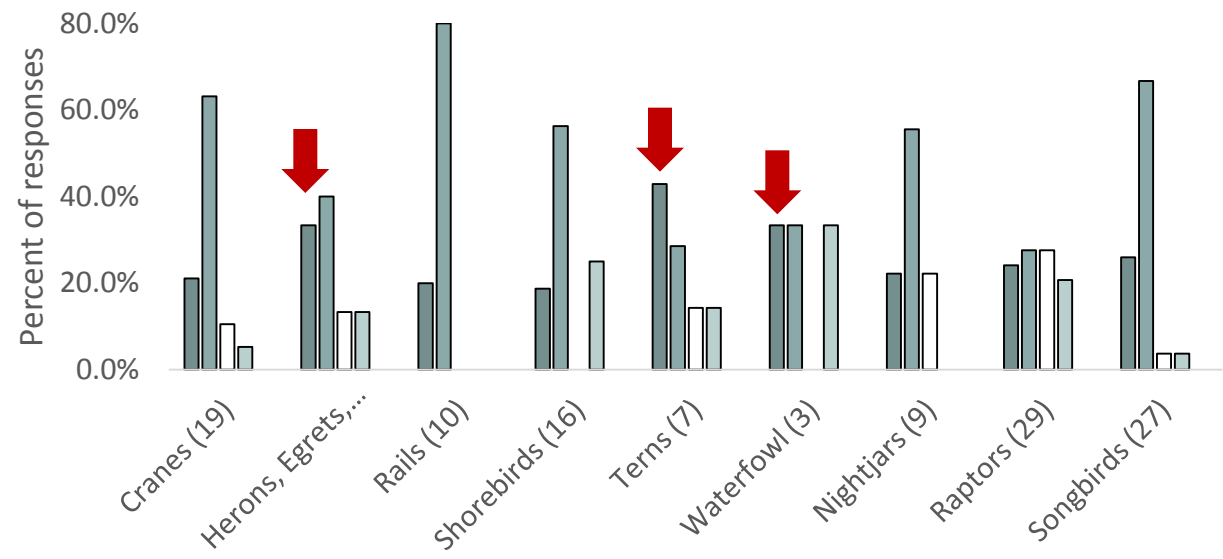
*Goal:* Understand current habitat conditions for SGCN in terms of both quantity and quality.

*Question:* How would you describe the **total amount** of habitat in Indiana available to [species]?

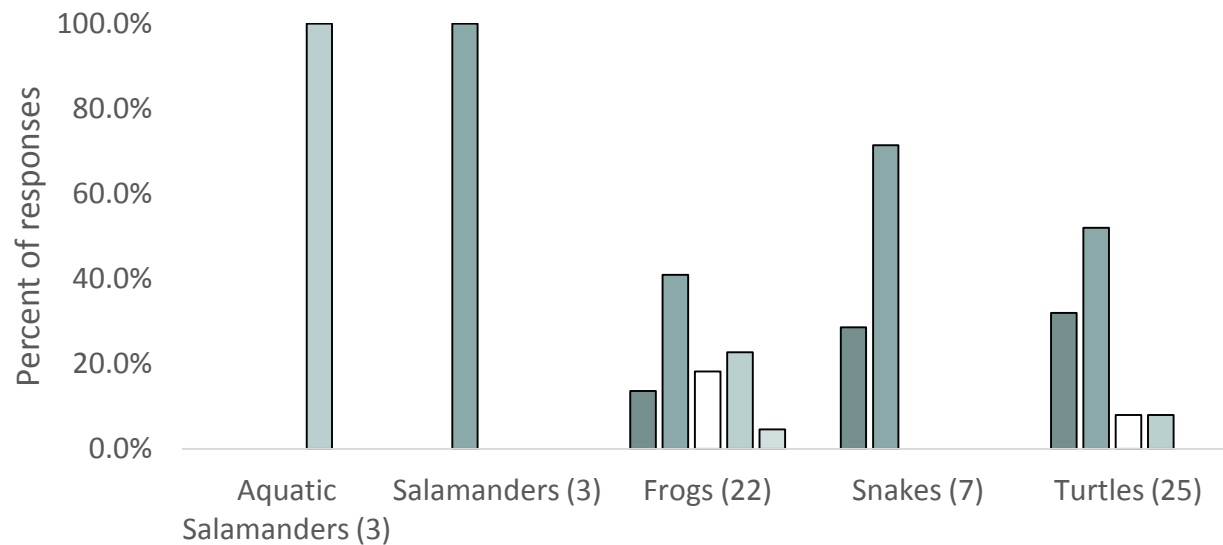
Current Amount of Habitat for Mammals



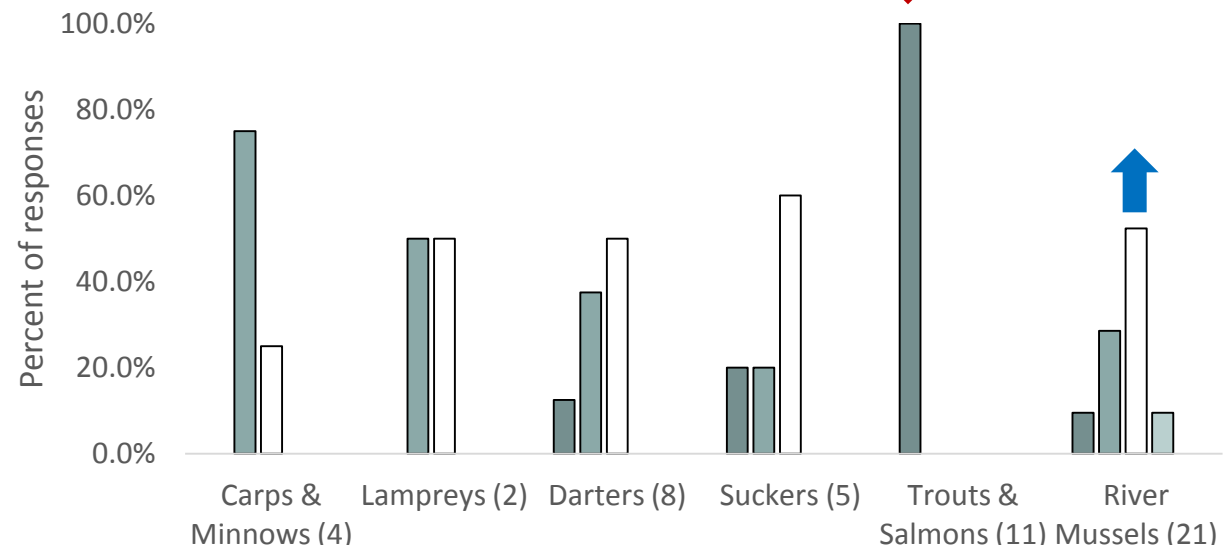
Current Amount of Habitat for Birds



Current Amount of Habitat for Amphibians & Reptiles



Current Amount of Habitat for Aquatic Species



Very limited

Limited

About right

Abundant

Very abundant

# Survey Results: Current Habitat Conditions

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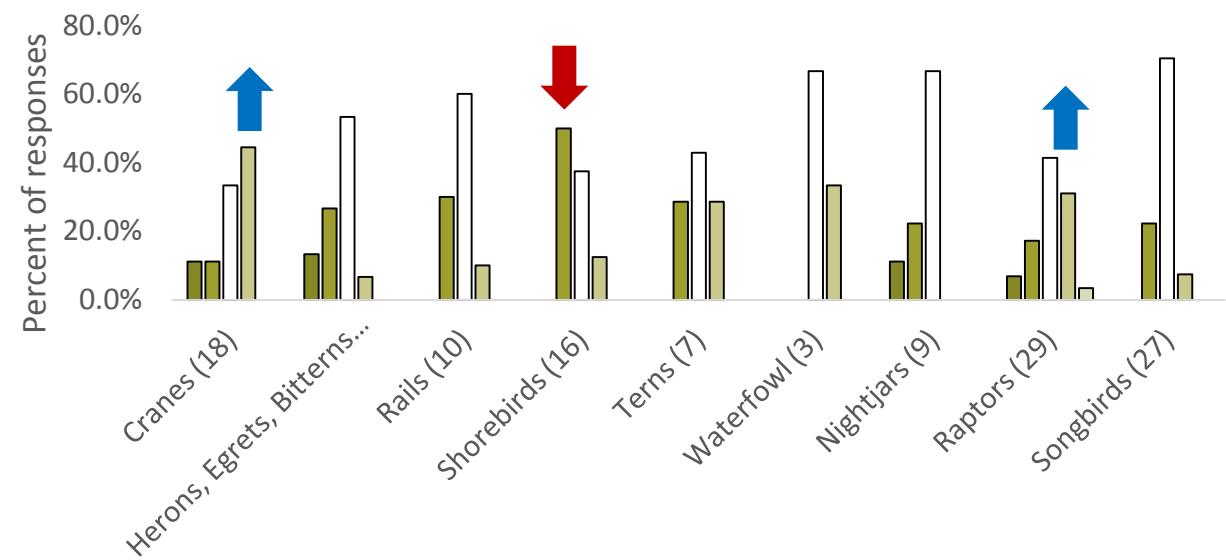
*Goal:* Understand current habitat conditions for SGCN in terms of both quantity and quality.

*Question:* How would you describe the **overall quality** of habitat in Indiana where [species] currently occurs?

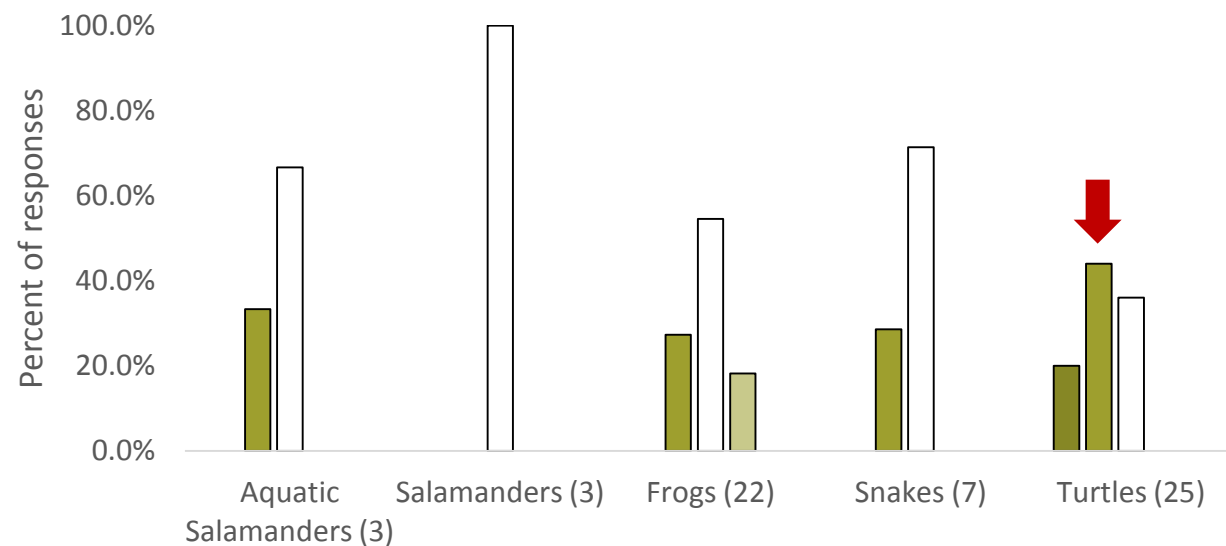
### Current Quality of Habitat for Mammals



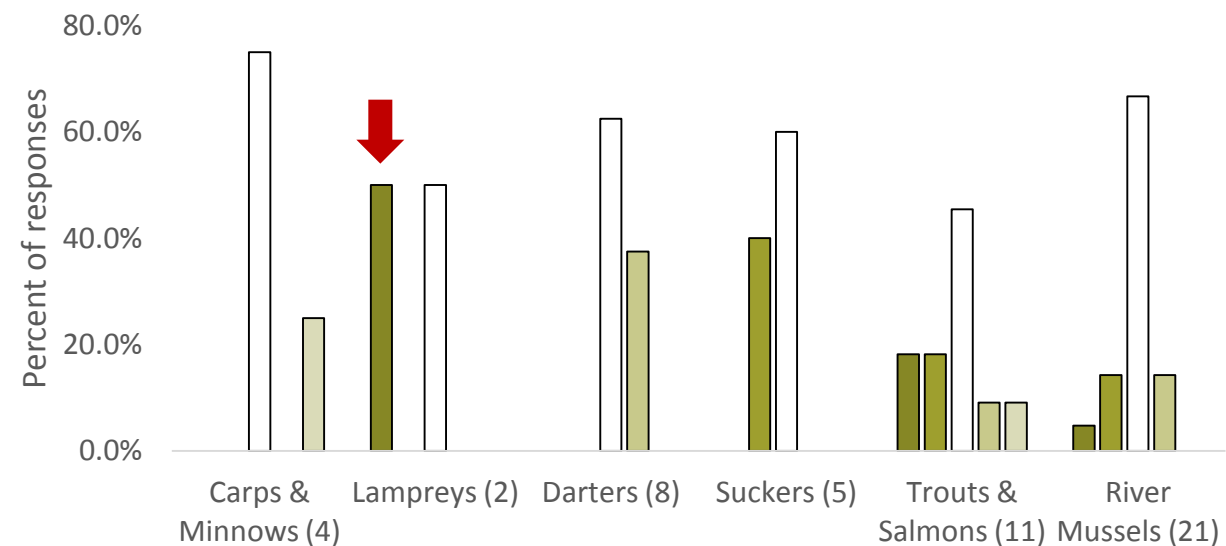
### Current Quality of Habitat for Birds



### Current Quality of Habitat for Amphibians & Reptiles



### Current Quality of Habitat for Aquatic Species



Very poor

Poor

Satisfactory

Good

Very good

# Survey Results: Habitat Trends

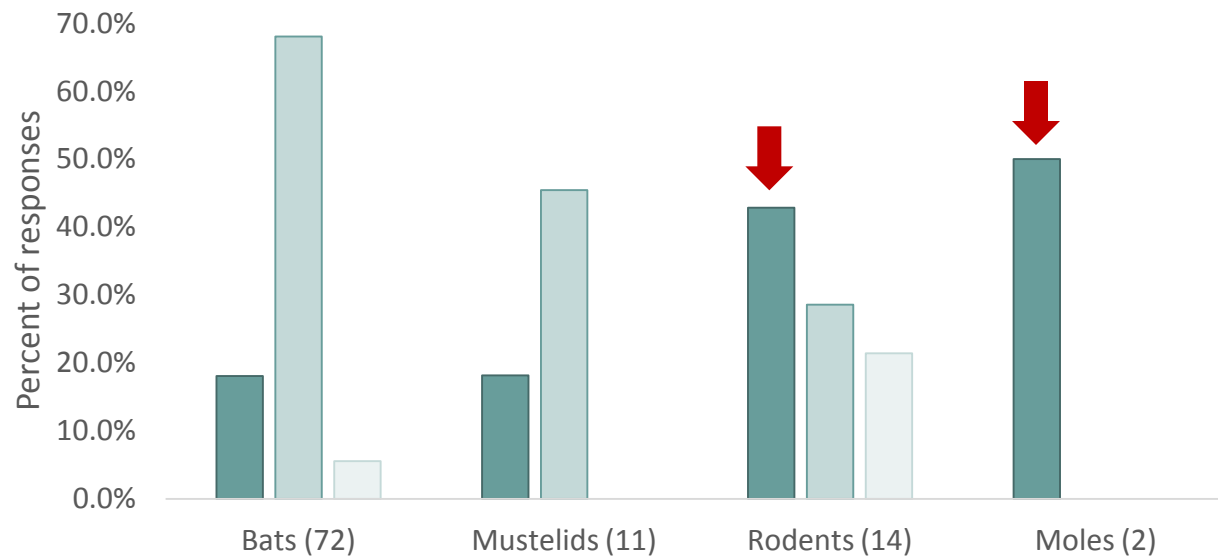
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*Goal:* Understand how habitat for SGCN has changed since the 2005 SWAP was implemented, in terms of both quantity and quality.

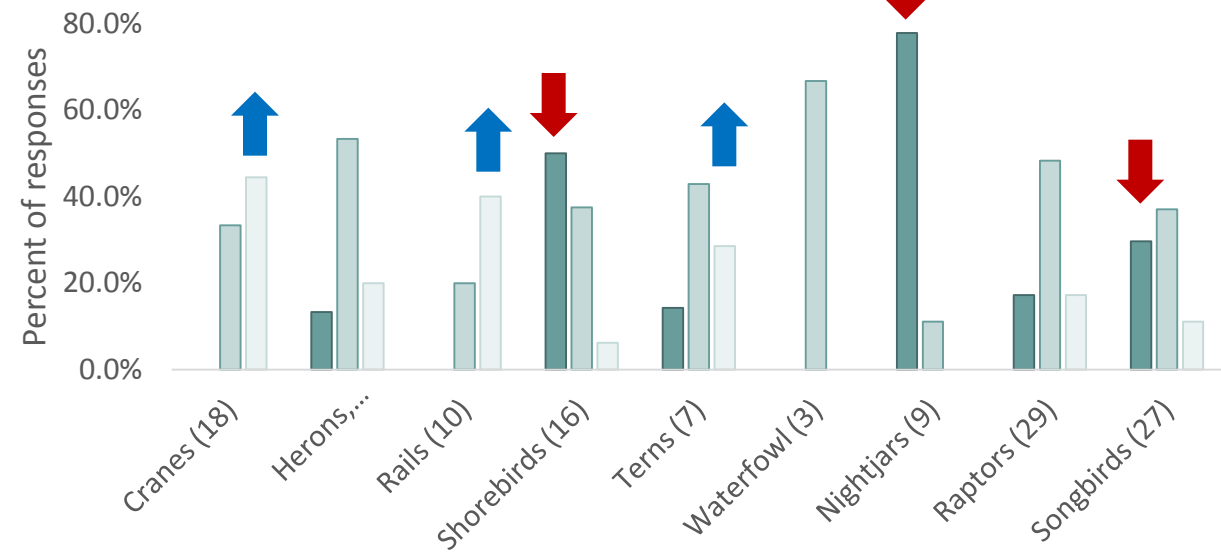
*Question:* How would you describe changes in the **total amount** of habitat for SGCN in Indiana **since 2005?**



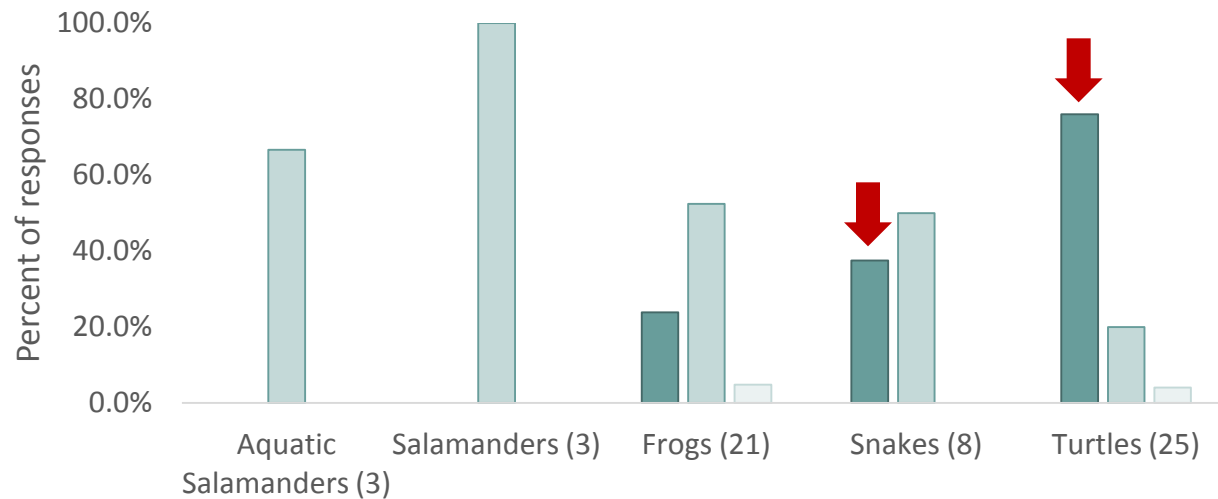
### Changes in Amount of Habitat for Mammals since 2005



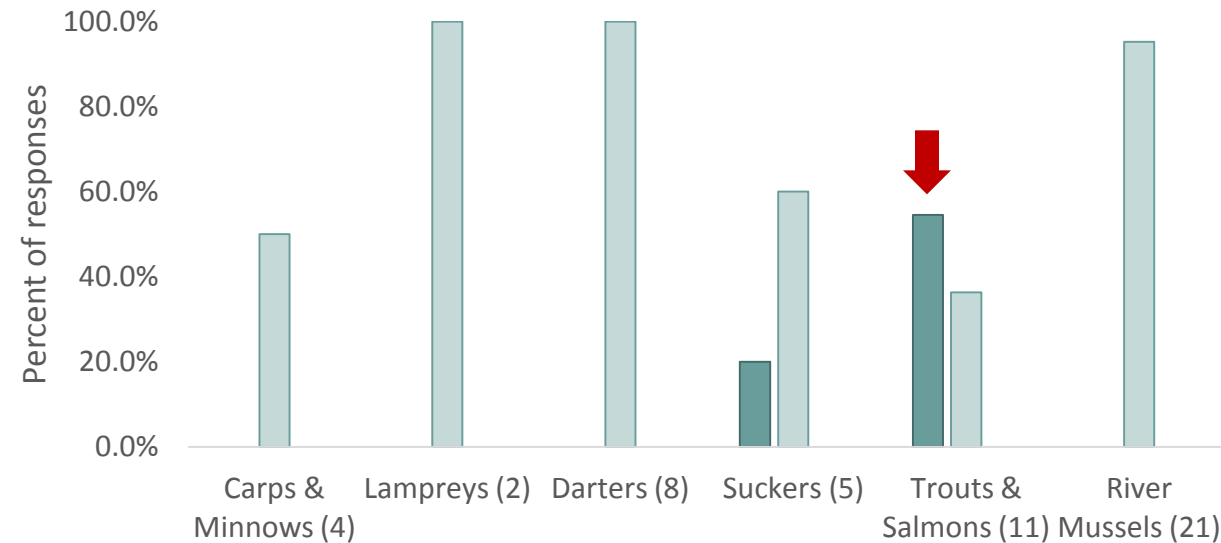
### Changes in Amount of Habitat for Birds since 2005



### Changes in Amount of Habitat for Amphibians & Reptiles since 2005



### Changes in Amount of Habitat for Aquatic Species since 2005



■ Decrease
 ■ About the same
 ■ Increase

# Survey Results: Habitat Trends

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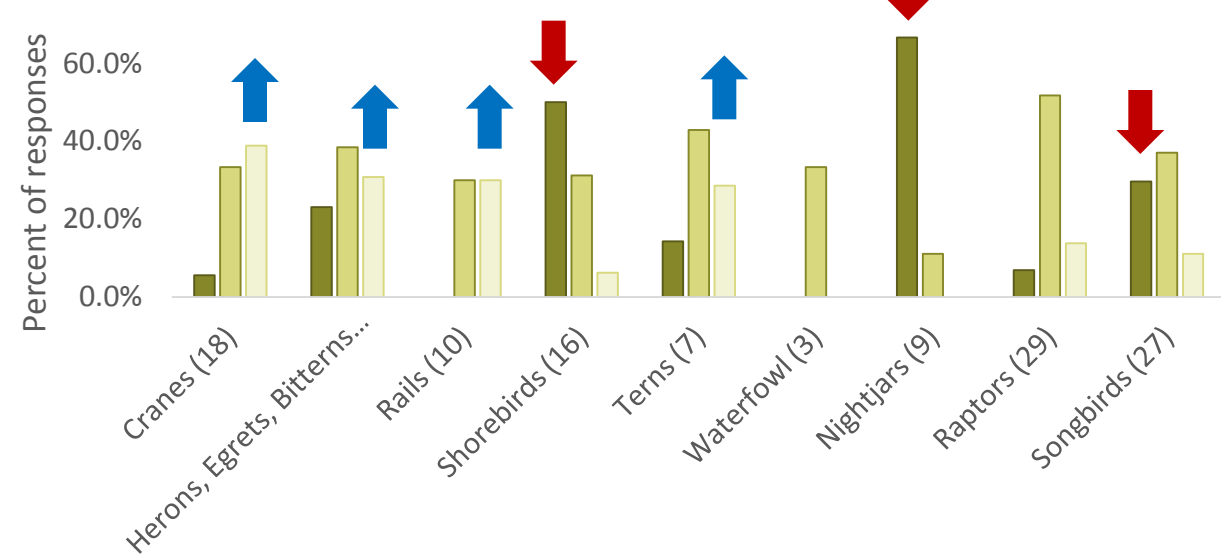
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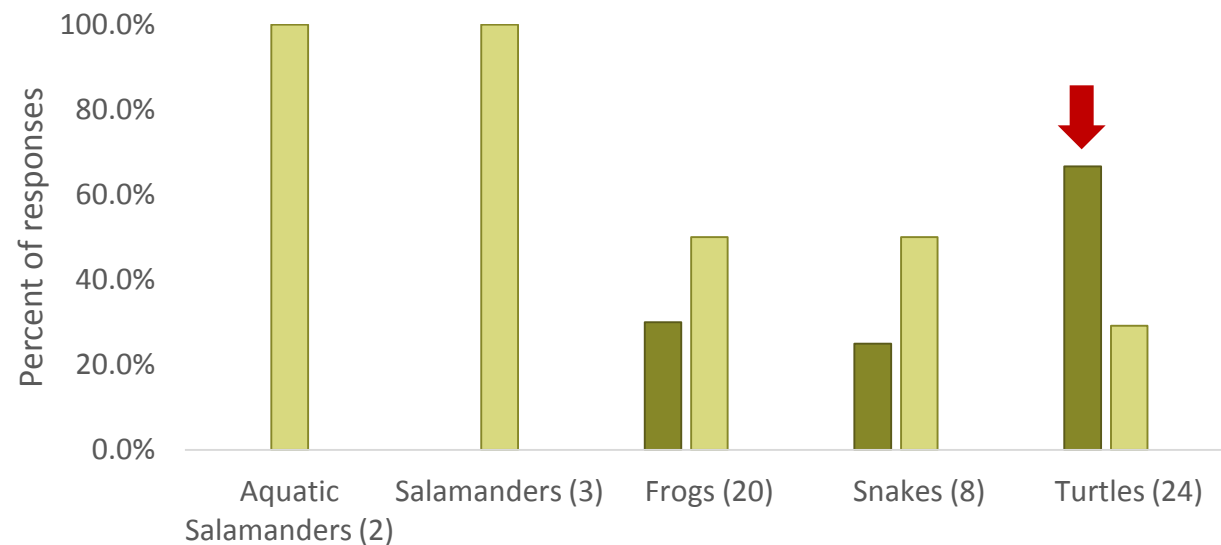
### Changes in Habitat Quality for Mammals since 2005



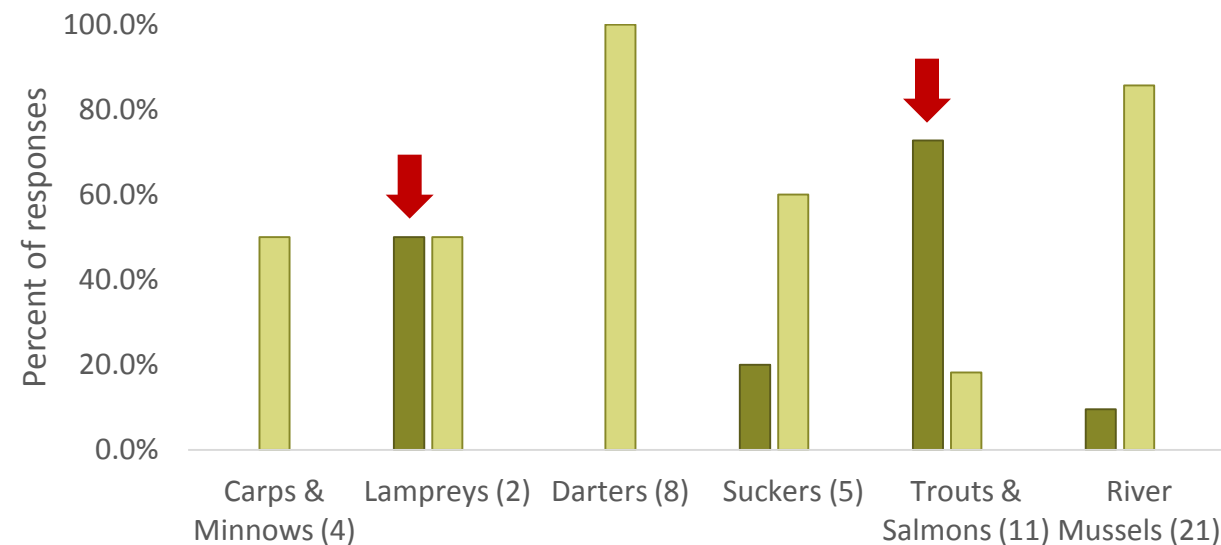
### Changes in Habitat Quality for Birds since 2005



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### Changes in Habitat Quality for Aquatic Species since 2005



Decrease
  About the same
  Increase

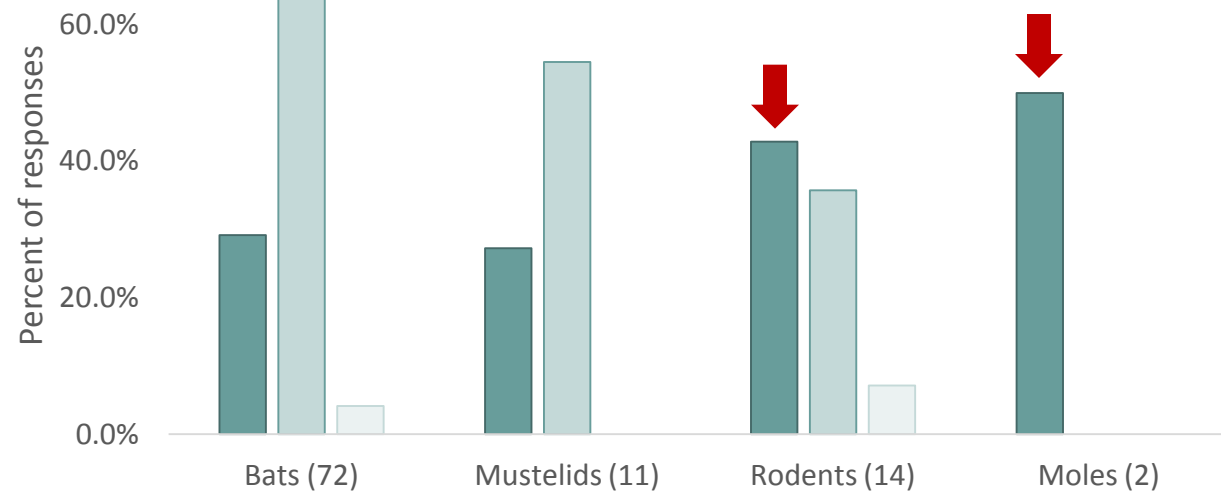
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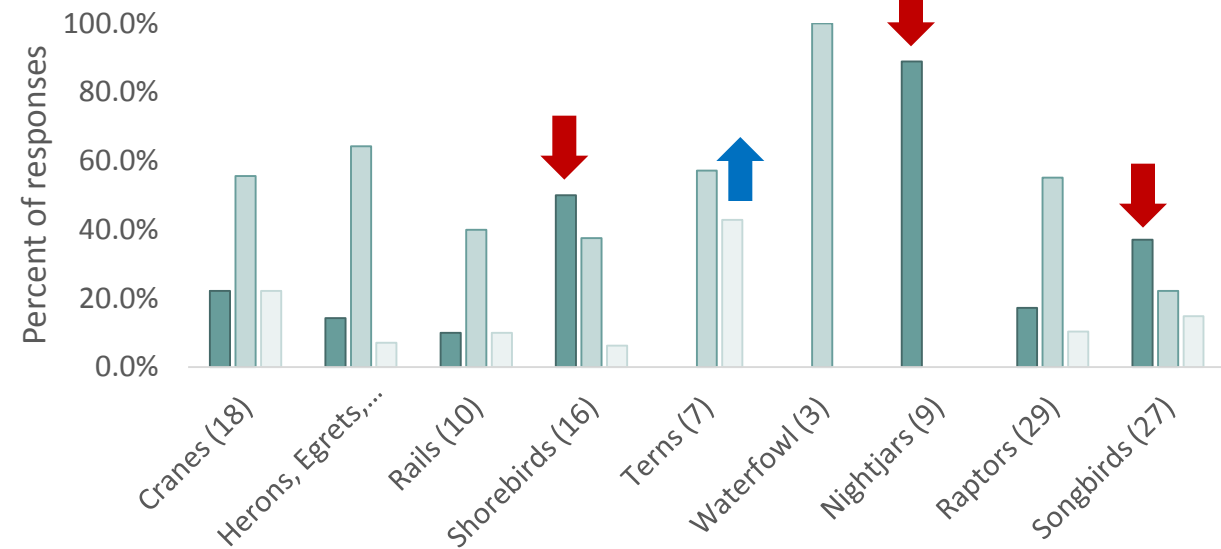
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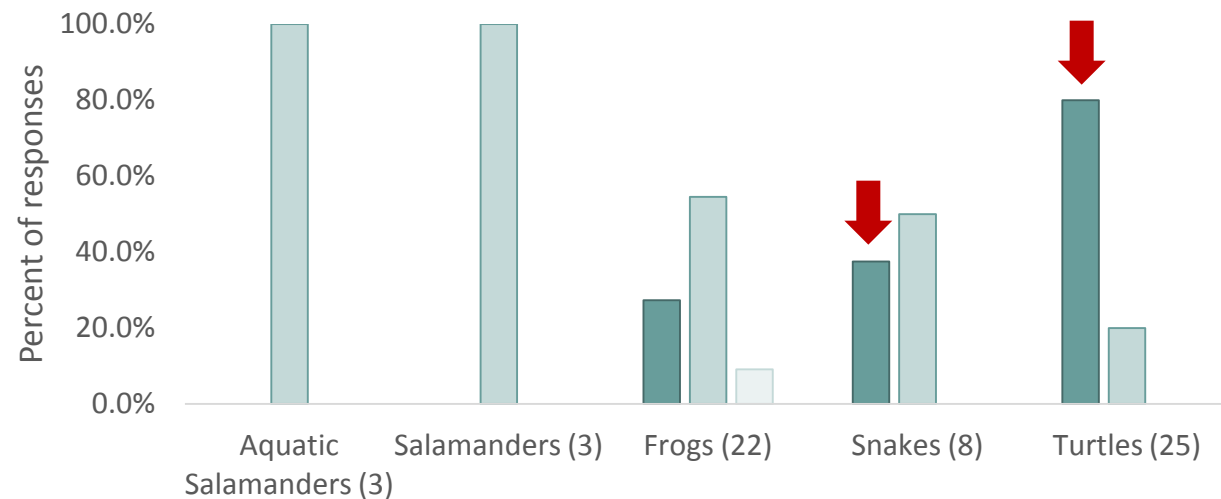
### Changes in Total Amount of Habitat for Mammals by 2025



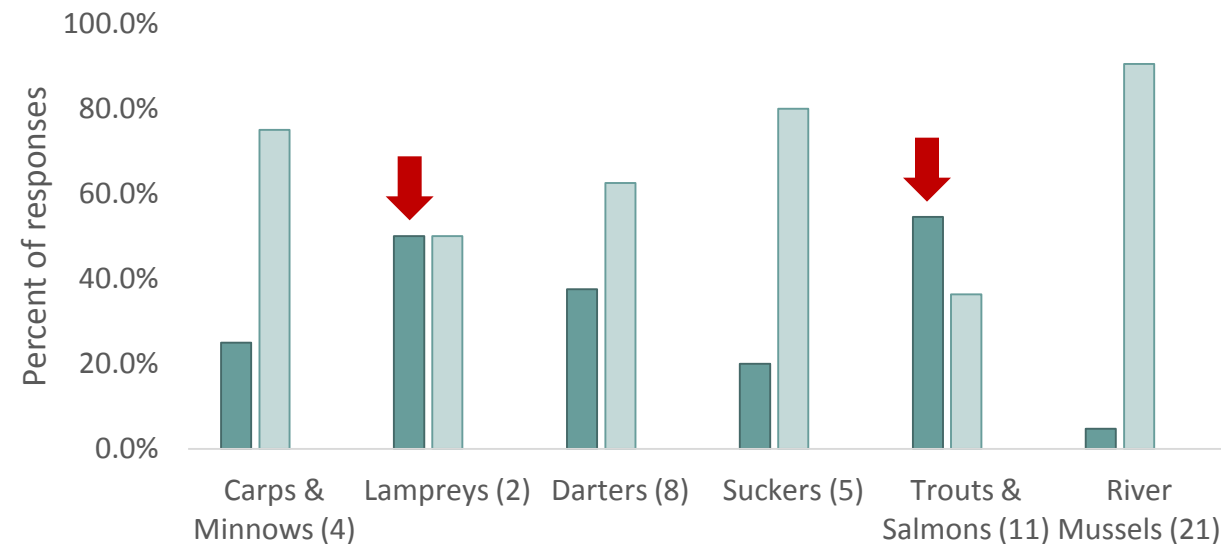
### Changes in Total Amount of Habitat for Birds by 2025



### Changes in Total Amount of Habitat for Amphibians & Reptiles by 2025



### Changes in Total Amount of Habitat for Aquatic Species by 2025



■ Decrease
 ■ About the same
 ■ Increase

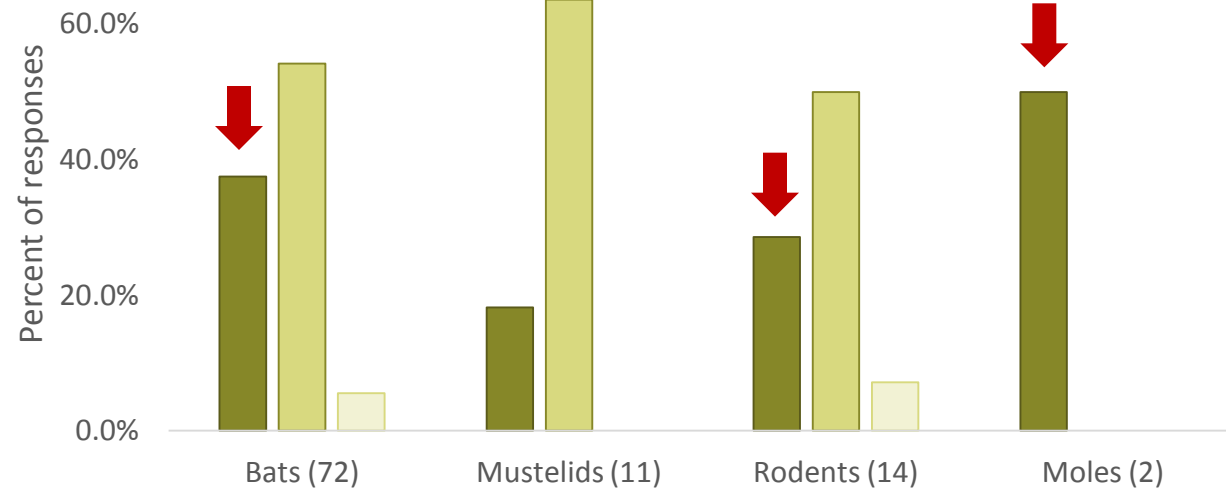
# Survey Results: Habitat Trends

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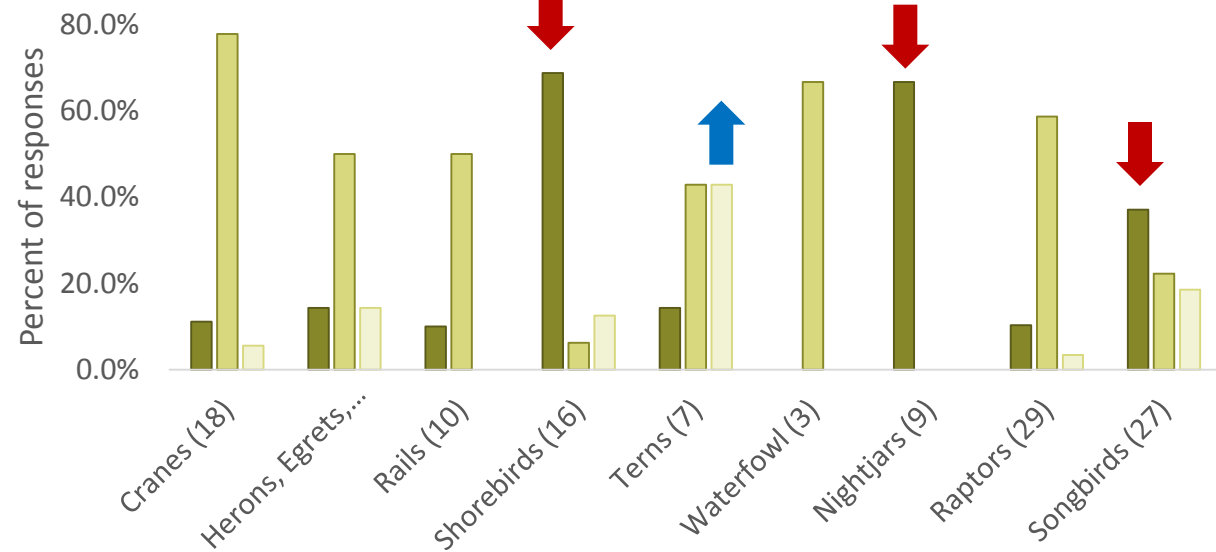
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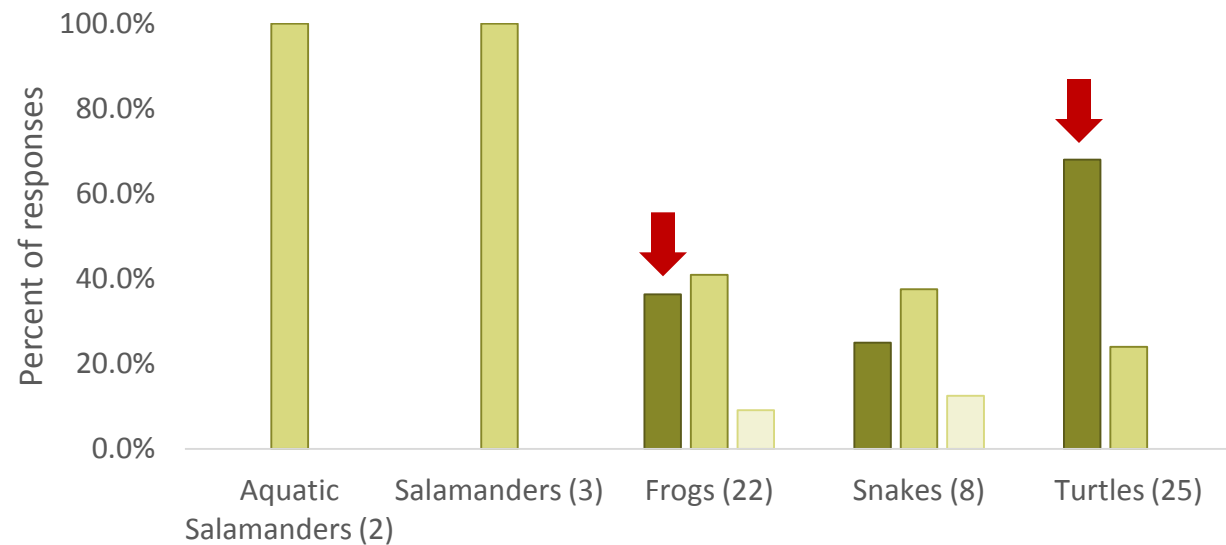
### Changes in Habitat Quality for Mammals by 2025



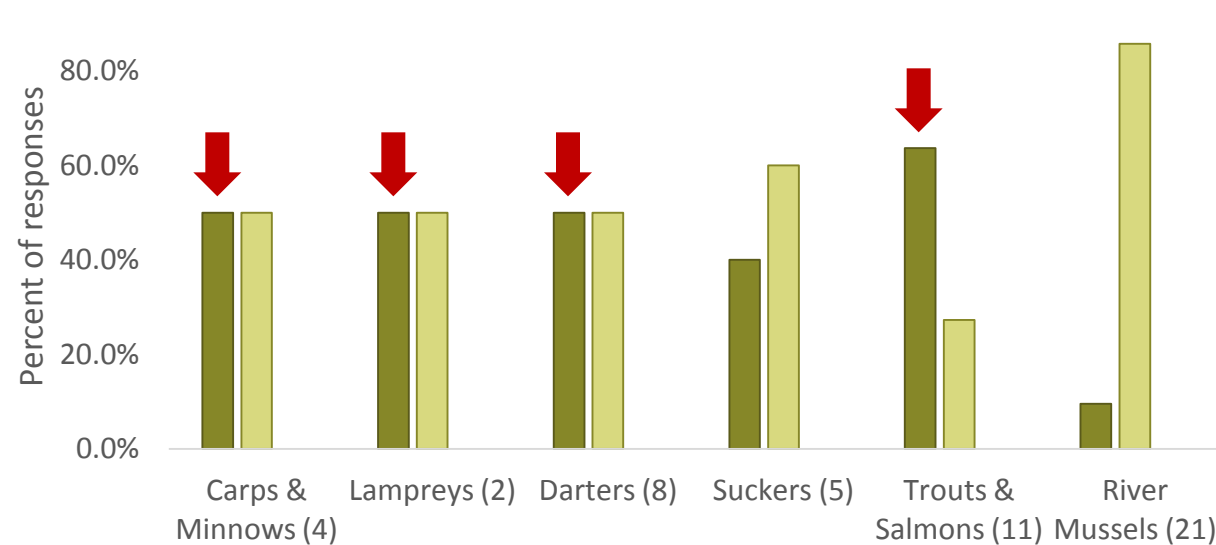
### Changes in Habitat Quality for Birds by 2025



### Changes in Habitat Quality for Amphibians & Reptiles by 2025



### Changes in Habitat Quality for Aquatic Species by 2025



■ Decrease
 ■ About the same
 ■ Increase

# Habitat Suitability Modelling

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USING THE BEST AVAILABLE SCIENCE TO INFORM  
INDIANA'S SWAP

**SWAP**

*Conservation doesn't just happen. It requires resources and collaboration.*

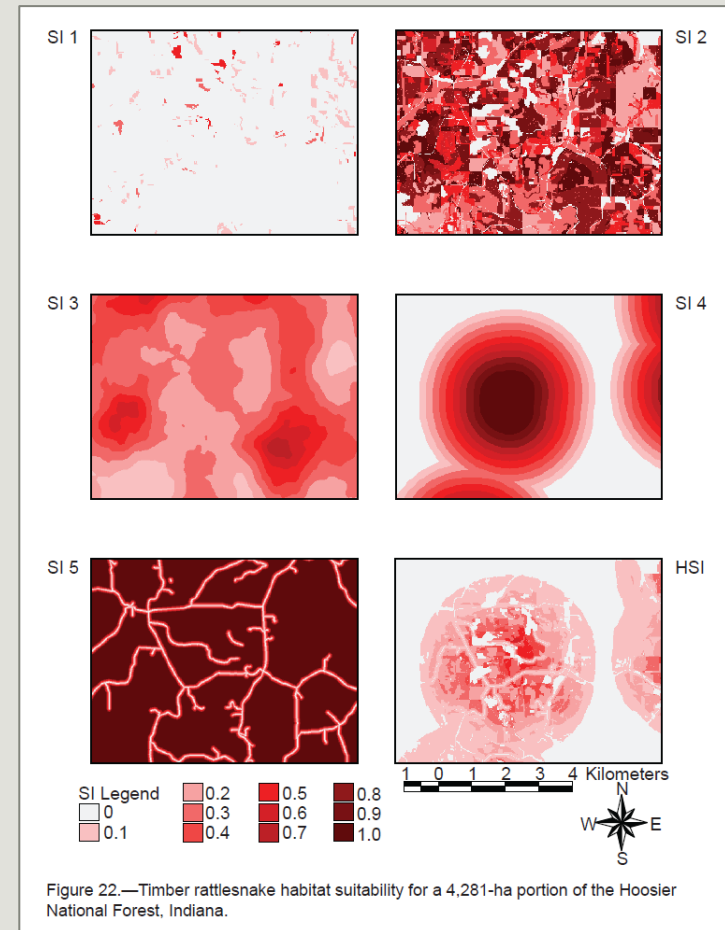


# Landscape-level Habitat Modelling

## Purpose

- Predictive tool to help us set priority actions
- Objective, quantitative metric
- Proof-of-concept for effectiveness of priority actions ranked in surveys

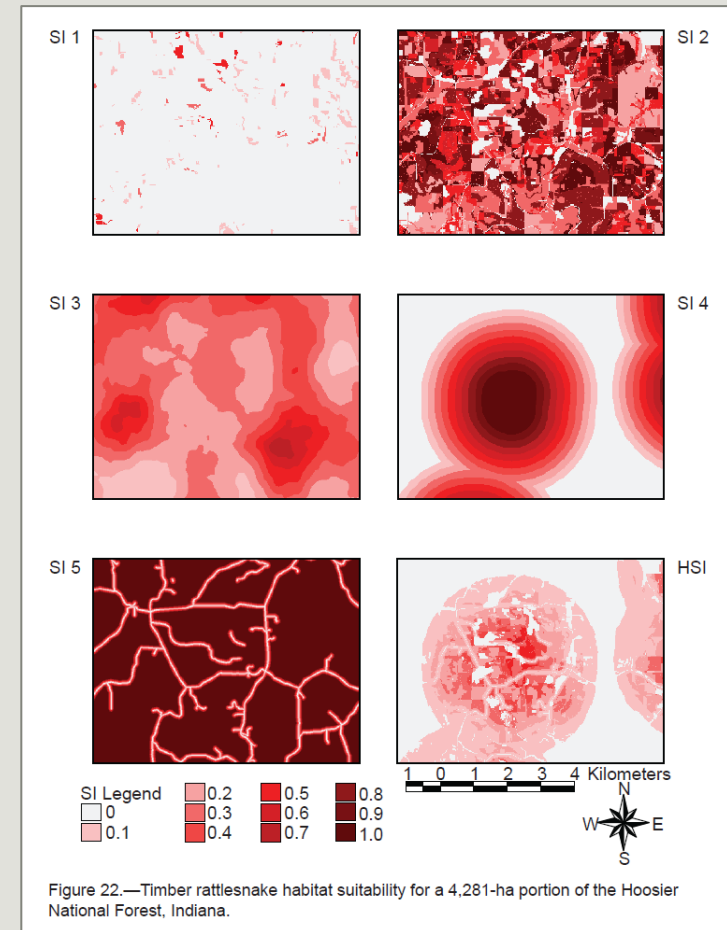
→ Timber rattlesnake landscape-level habitat suitability maps. Individual suitability indices contributed to the HSI: early successional forest and canopy gaps, woody debris (stand age), habitat composition, proximity to hibernacula, distance from roads (Rittenhouse *et al.* 2006).



# Landscape-level Habitat Modelling

## Process

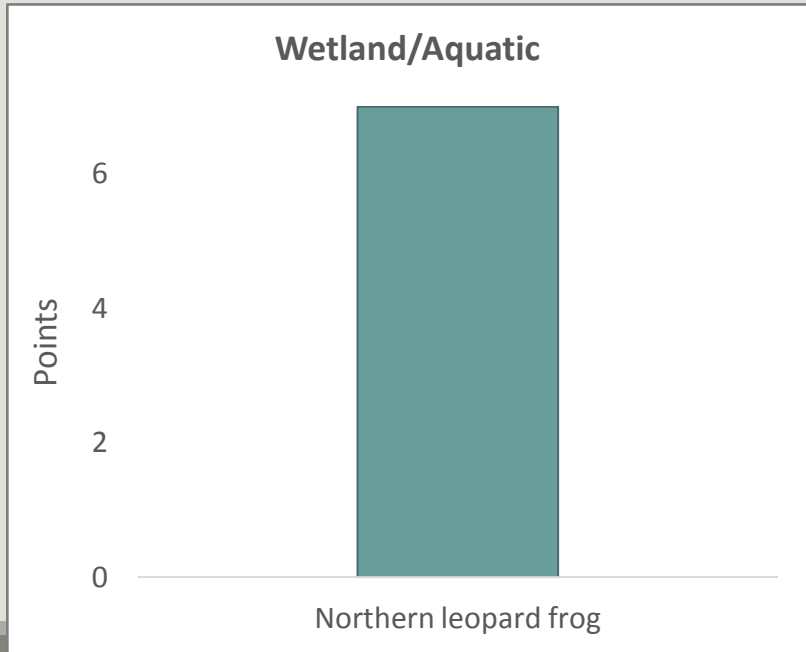
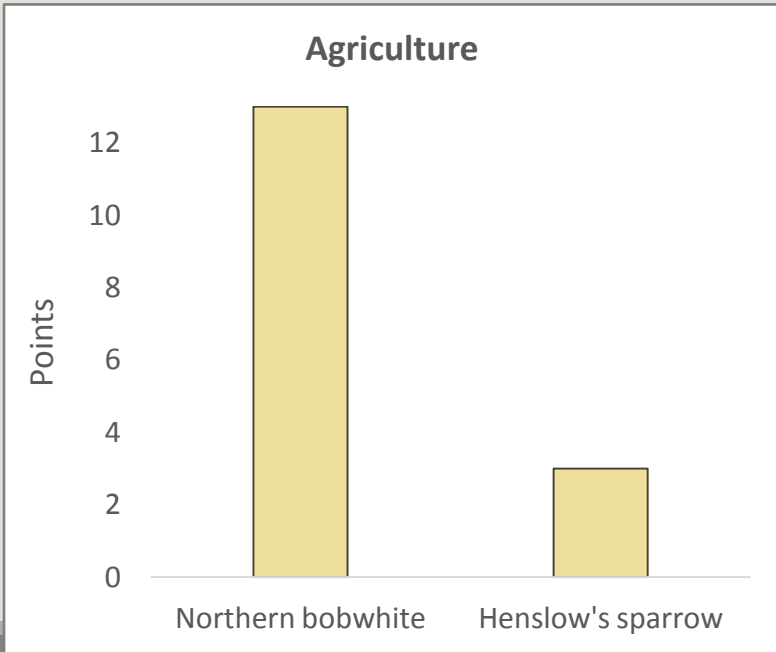
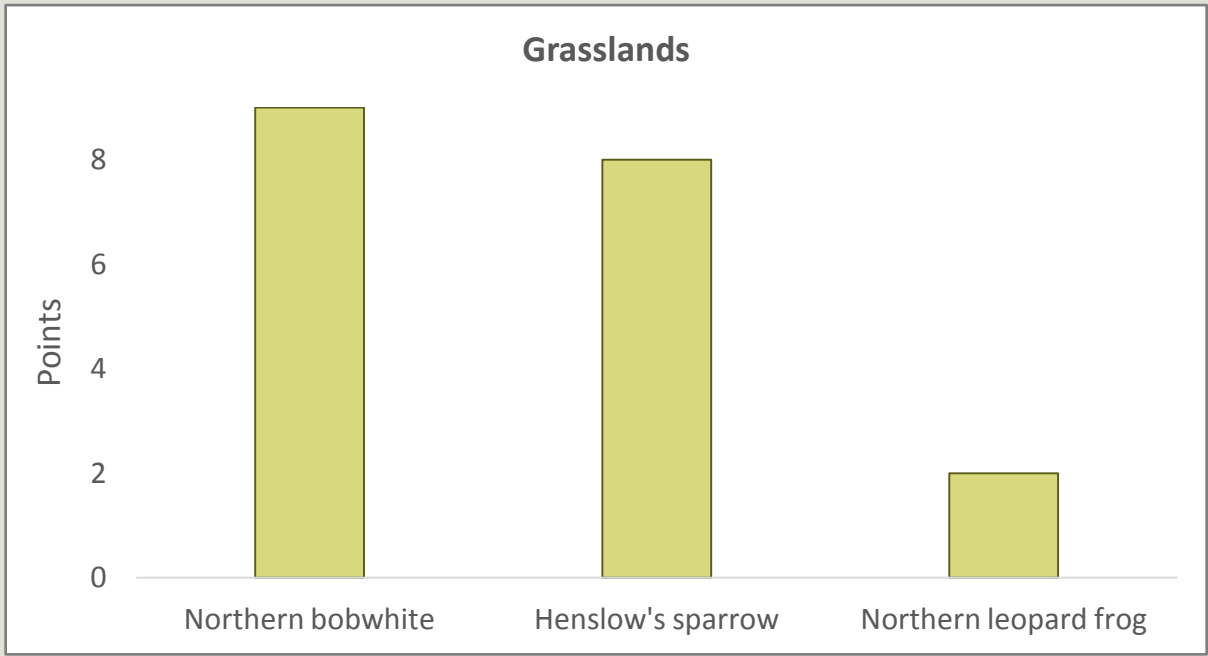
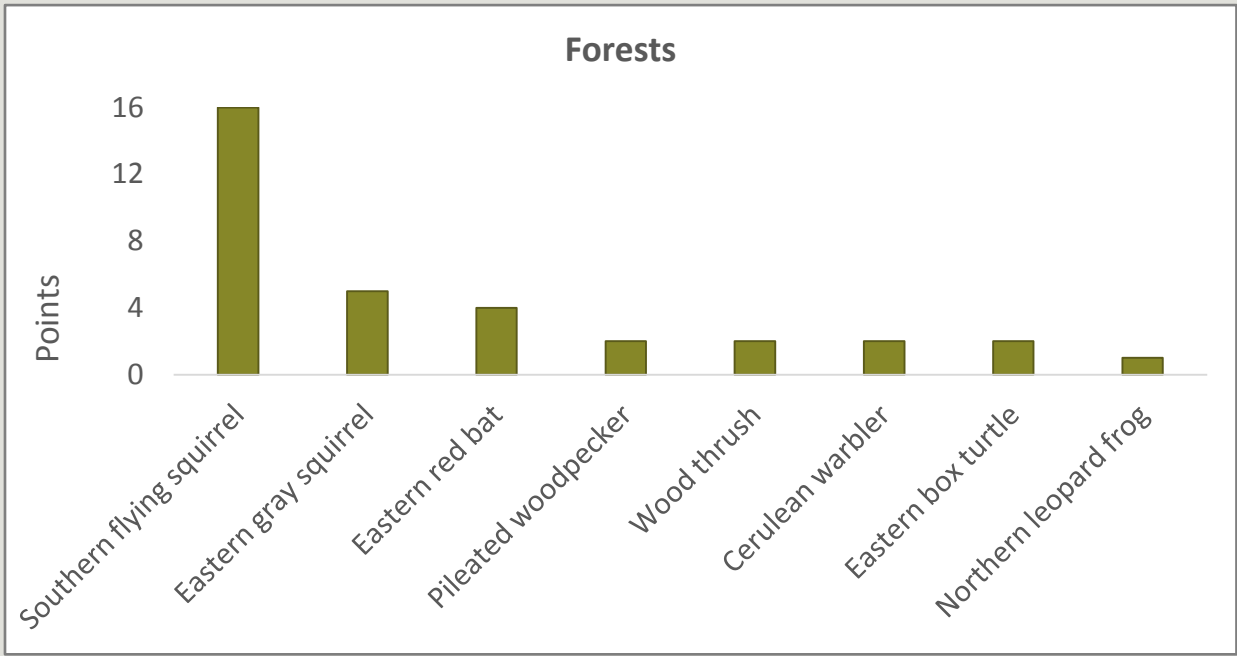
- Implement models for suite of representative species (4-5) in each region in GIS environment
- Assess habitat suitability with current conditions
- Construct alternate landscape configurations representing possible outcome of actions
- Reapply models to future landscapes and assess how habitat suitability has changed
- Evaluate relative effectiveness of action scenarios
- Use results to inform prioritization of actions



# Selection of Species for Modelling

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1. Conducted focus group with ~20 species technical experts to produce initial list of options for each region
2. Species suggested were based on a set of criteria:
  - a. Actions on the ground make a difference in habitat quality for the species
  - b. Improved habitat quality for the species could represent improvement in habitat quality for a wide range of other species (umbrella effect)
  - c. Enough data available to build a model
3. Survey 1 respondents voted or suggested additional species



# Selection of Species for Modelling

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4. Ranked species by survey responses and selected final suite based on:
  - a. Best data availability for models
  - b. Representation of multiple taxa
  - c. Representation of all focal habitat types in each region
5. Final lists were reviewed and approved by Core & Advisory Teams and IDNR wildlife diversity staff

# Region 3 Habitat Models

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*Species selected:* northern bobwhite, southern flying squirrel, eastern red bat, northern leopard frog, Henslow's sparrow\*, American woodcock\*, cerulean warbler\* (\*=time-permitting)

*Habitats/features of interest represented:* Grasslands, ag lands, mature forest, early successional forest, suburban areas, aquatic systems, wetlands, wind farms, habitat connectivity